

Number, point and space: The Islamic tradition

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Islam is at once the oldest and the youngest of the monotheistic religions of the Middle-East. According to its tenets, it is the religion of Abraham, restated through the Prophet Mohammed in the 7th century CE (Holy Qur'an 11:130, 111:67-69).

The central statement or *shahādah* declares simply but with no uncertainty, - *Lā ilāha illa'Llāh* - there is no god but God, which, in its most profound sense,

means that there is no reality outside the Absolute Reality, thereby negating all that is other than Allah. The formula of Unity is the most universal criterion of orthodoxy in Islam; that doctrine may be said to be Islamic that affirms this unity in one way or other (Nasr 1978:5).

Established at a time when artistic creation was considered as a substitute for reality and thus an intermediary between man and that reality (Grabar 1973:101), it is not surprising that Islam developed a sacred art in conformity with its own revealed form as well as with its fundamental nature. The principle of Unity brought into being an aniconic art in which the spiritual world was reflected in the sensible world not through iconic forms but through calligraphy, arabesque, geometry and rhythm.

As the final assertion of the revelation Islam is also the means to the rediscovery of the sacred character of the first of God's revelations¹ which is the created order itself. Islam contains the means to enable man to see the forms of nature once again as the *vestigii Dei* and multiplicity as so many reflections of the Unity which is both the origin and end of the order of multiplicity (Nasr 1976:6).

It is only during the past half century that some scholars in the west have become aware of the meaning embodied in Islamic art - a mathematical description of multiplicity in unity. These mathematical forms are not seen as mental abstractions but as reflections of celestial archetypes within the cosmos and the minds of men.

In the west, even by well-informed academics versed in the validity of perspective and chiaroscuro, Islamic art has often been condemned as "decorative" or "ornamental". It is a further truth that in the Western mind hardly a worse accusation could be levelled against any form of art, especially when in conjunction with architecture, than it being decorative.

An early exception was Owen Jones (1809-1874), who considered the Alhambra at the very summit of perfection of Moorish art:

The Moors ever regarded what we hold to be the first principle in architecture - to



Arabic is used worldwide in religion and in the mosque, it transcends the language barriers of the faithful. Since the earliest times, the Word of Allah has been represented in the best possible script and the writing and rewriting of the Qur'an was elevated to the highest form of art. Calligraphy was also applied to objects for everyday usage. **FIGURE 1:** Large platter with Kufic inscription, possibly from Samarkand, C10, Louvre, Paris (Burckhardt 1976:48). In religious architecture, writing played an even greater role and it was used in particular to decorate domes. **FIGURE 2:** Dome in the Ashrafiyya Mosque, Ta'izz, Yemen, C14 (Frishman & Khan 1994:87, detail of photo: Bernard O'Kane). **FIGURE 3:** The Ka'ba in Mecca as the centre point of the Muslim world. Title plaque of an atlas from 1551 indicating the orientation of the Muslim countries in respect of Mecca – an essential determinant for the direction of prayers (Lewis 1976:17).

decorate construction, never to construct decoration: in Moorish architecture not only does the decoration arise naturally from the construction, but the constructive idea is carried out in every detail of the ornamentation of the surface. ...we never find a useless or superfluous ornament; every ornament arises quietly and naturally from the surface decorated (Jones 1986:67).

The fact that Islamic art was seen as purely decorative would bewilder the Muslim who can argue that the source of these "patterns" was indeed natural in that they explore the natural and cosmic order, were reflections of the timeless truth of the unity expressed in the *shahādah*. In this short essay only two aspects of the expression of this unity is discussed.

Throughout his life, the Muslim is guided by the infallible word of the Holy Qur'an, supported by the *hadith* and the *ijma* or consensus of the community. In the mosque, Arabic remains the language of the Book to obviate the possibility of erroneous translation. The Qur'an is not a thick book and it is studied in depth rather than in concert with other sources. According to Islam, man cannot make laws, he can only be obedient to the immutable Divine Law. Theological investigation means to delve deeper and deeper and interpretation or *ta'wil* literally means to return to the source. In geometric art, this implies the discovery of layer

upon layer of complexity in the design.

The first art form to consider is therefore calligraphy. It is also the highest because it gives visible form to the revealed word of God as collated in the Qur'an.

The theory of numbers played an important role in the development of science, mathematics, but also art. Numbers were seen as keys to the structure of the cosmos and it was their qualitative, rather than quantitative character that kept artists interested. Numerical symbolism is embraced, patterns are discovered, reflection of underlying unity mirrored.

20	22	3	2	18	1	2	3	4	5	6	7	8	9	
25	12	17	10	1	2	4	6	8	1	3	5	7	9	
5	11	13	15	21	3	6	9	3	6	9	3	6	9	
7	16	9	14	19	4	8	3	7	2	6	1	5	9	
8	4	23	24	6	5	1	6	2	7	3	8	4	9	
					6	3	9	6	3	9	6	3	9	
						7	5	3	1	8	6	4	2	9
						8	7	6	5	4	3	2	1	9
						9	9	9	9	9	9	9	9	9

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Magic squares and amicable numbers were especially popular. These squares (9, 12, 16, 25, 36 components) are characterized by the fact that the sum of the numbers read horizontally, vertically or diagonally, remains



FIGURE 6: Baghdad was founded in 762 by Caliph al-Mansur. Four streets led from the centre to four gates and from there to the four corners of the empire. The palace and the mosque were at the hub of the city which rippled out concentrically from there (Cresswell 1958:165). **FIGURE 7:** Maps of Jerusalem from the era of the Crusades turned the city into a schematic circle. In the top half, the Dome of the Rock and al-Aqsa Mosque are indicated as *Templum Domini* and *Templum Salomonis*. Map of Jerusalem (detail), The Hague, Koninlijke Bibliotheek (Hattstein & Delius 2000:166). **FIGURE 8:** In the great mosque, Dinguera, Guinea (1883-) the circle of the roof structure and the cube of the prayer hall (a reference to the Ka'ba) are united (Freshman & Khan 1992:193, detail).

constant (Figure 4). Another pattern that has held significance is the multiplication or Vedic square.

The square is formed on a nine-by-nine grid numbered one to nine horizontally and vertically. At the intersection of each of the columns is the product of the two numbers, reduced, in line with the Cabbalistic system, to a single digit by adding two digits if the result is more than nine (Albarn era/. 1974:11-14).

Following the concentric rings of squares, we find that the numbers in each ring add up to nine (Figure 5). Thus from a simple 'whole' we are able to abstract concepts like numbers, enclosure, pairs, concentricity, reflecting symmetry and repeats.

... these self-evident mathematical patterns with their esoteric philosophical values became the invisible foundation upon which the 'art' was built. This meant that the Islamic artist was not only versed in mathematics in the geometrical sense, but that mathematics was integral to his art as it was a 'universal' structure supporting intuitive insights... (Critchlow 1976:8).

Islam is often referred to as the religion of the point - the single all-encompassing source

from which everything originates and to which everything returns. This is even clear to every believer, wherever he finds himself, when he turns his face towards Mecca to pray. He is aware of the fact that every other believer is doing the same thing and that all prayer is united in the Ka'ba. He is also aware that the compulsory *hajj* (pilgrimage to Mecca) will allow him to discover this origin and centre for himself and to confirm it.

The manifestation of an action, object or thought (if it can be defined) necessitates a point of origin or departure, in the physical world it represents a focal event in a field which was

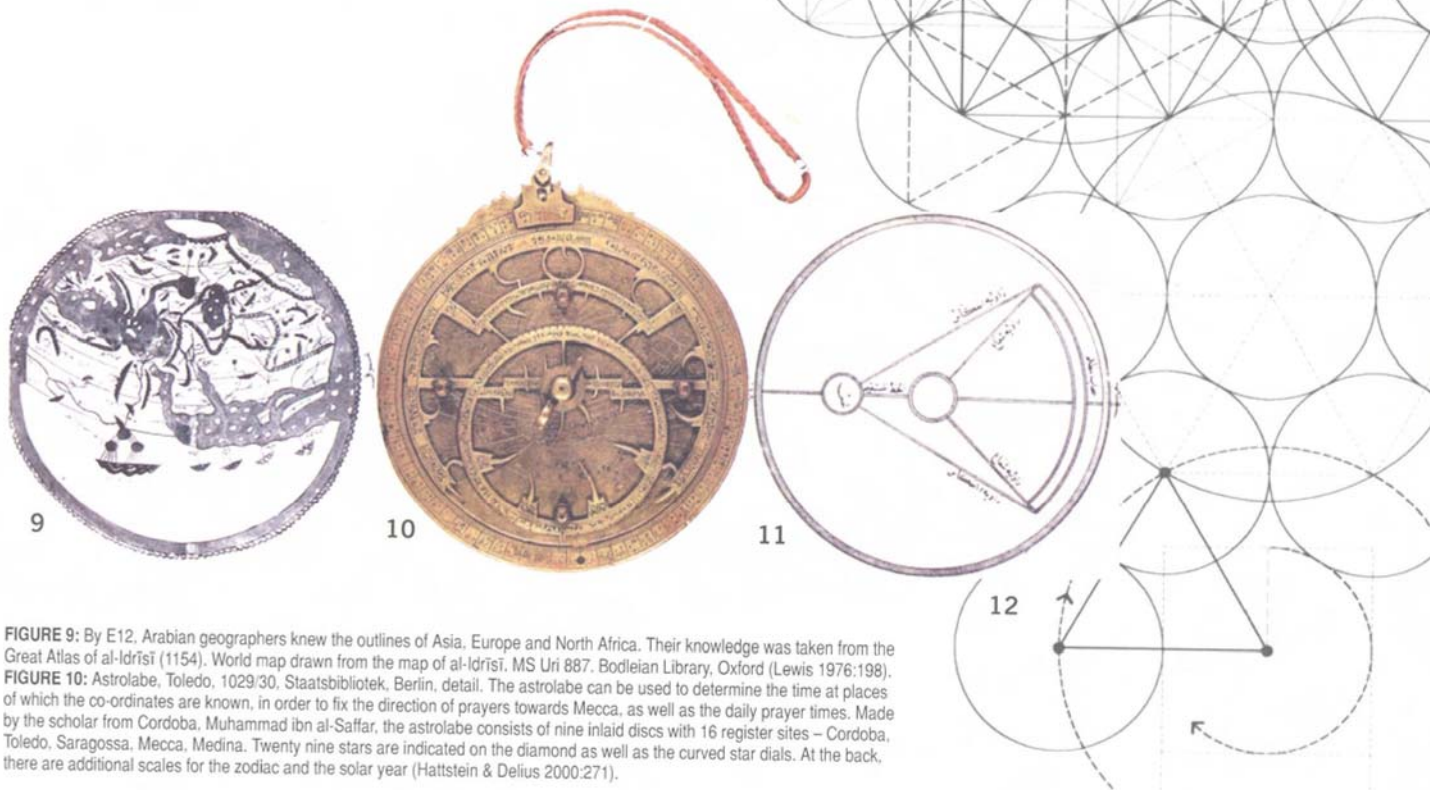


FIGURE 9: By E12, Arabian geographers knew the outlines of Asia, Europe and North Africa. Their knowledge was taken from the Great Atlas of al-Idrisi (1154). World map drawn from the map of al-Idrisi, MS Uri 887. Bodleian Library, Oxford (Lewis 1976:198).
 FIGURE 10: Astrolabe, Toledo, 1029/30. Staatsbibliothek, Berlin, detail. The astrolabe can be used to determine the time at places of which the co-ordinates are known, in order to fix the direction of prayers towards Mecca, as well as the daily prayer times. Made by the scholar from Cordoba, Muhammad ibn al-Saffar, the astrolabe consists of nine inlaid discs with 16 register sites - Cordoba, Toledo, Saragossa, Mecca, Medina. Twenty nine stars are indicated on the diamond as well as the curved star dials. At the back, there are additional scales for the zodiac and the solar year (Hattstein & Delius 2000:271).

previously uninterrupted (Critchlow 1976:9).

The point is the symbol for unity and origin; in terms of geometry it represents the centre or controlling source (Figure 12). To depart from the source, direction is implied and the point externalises itself. Should the active point move in another direction, controlled by the passive source, an arc is drawn. When the arc is closed the result is a circle which reflects the unity of the original point. The circle has no end and no beginning and outside the concept of time it was always the symbol of eternity - it is also the parent of all polygons.²

The circle can follow the same path as the point till it becomes a reflection of itself and the first measurement (between centres) becomes possible. By repetition a third circle can be moved till all three just touch each other and the principle polygon, the triangle is formed - area can be measured. New centres, created at the points of contact, allow the pattern to be repeated over and over. Furthermore the created plain can rotate to describe or create the solid or third dimension. The point and the circle which has guided the design and around and in which the basic design has been traced, remains implicit and is rather felt than seen.

The key to the construction of this complex geometric ornament is through a grammar of mathematical principles rather than any

obscure form of cipher. The mode of their composition entails a constant abnegation of free choice on part of the artist in favour of the constraints of symmetry and laws of proportion (Wade 1976:10).

Popular designs are based on dividing the circle by five, six or eight, the latter based on the octagon formed by two inscribed squares, the basis of the pattern in figure 15 and the plan of the Dome of the Rock, figure 14 (Burckhardt 1976:63). These forms are then elaborated by multiplication and subdivision, by rotation and symmetrical arrangements (Jones 1978:170). The amazing variety of patterns can eventually be reduced to a series of comparatively simple geometric shapes (Hill 1964:80; Wilson 1988:15).

The aim of the artist is to explore the multiplicity in unity, the aim of the observer is to abstract the unity from the many ways possible to reflect it.

If we take these moves into the three dimensions as being symbolic of the creation of space of our world, then it follows that we can reverse them in the folding up of the dimensions, leading us back to the point of unity or the indivisible (Critchlow 1976:7).

The principle of this concept is not restricted to the illumination of architectural form:

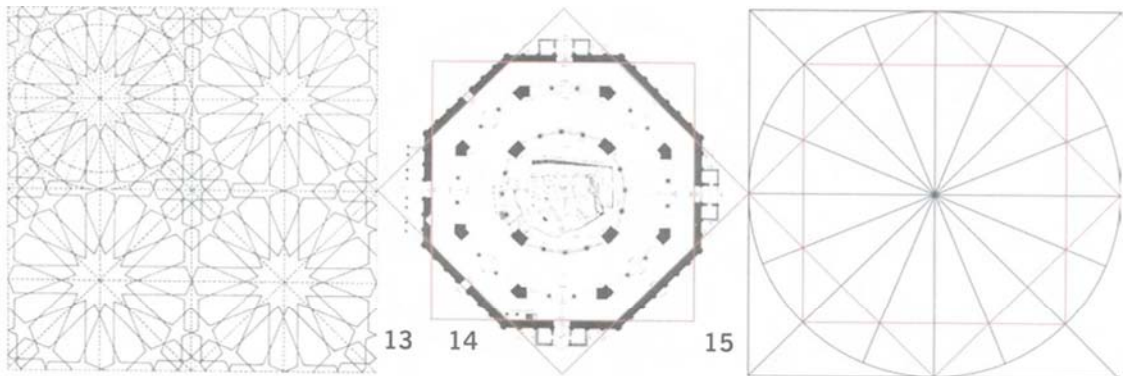


FIGURE 11: Representation of Ibn Sinā's explication of the rainbow. The light of the rising sun (small circle to the left) is reflected to the observer from two points on a dark cloud (double arch to the right). Avicenna wrongly emphasised that the dark background was needed for the drops to serve as mirrors. Diagram from al-Qazwīnī's *Wonders of Creation*, MS. British Library, London (Lewis 1976:190). **FIGURE 12:** Development from the point to an extensive pattern (according to Critchlow 1976:9–19). **FIGURE 13:** Pattern from the octuple division of the circle. The geometric development from an octagon, or rather from two squares inside a circle (Figure 15), is common in Muslim art. It is the underlying order for the plan of the Dome of the Rock, the oldest (688–92) extant Muslim building, Figure 14 (Landay 1978:70), and the dome of the Mosque of the Islamic Centre (1977) in Rome by Paolo Portoghesi seen in Figure 16 (Freshman & Khan 1992:260, detail of photo: Antonio Martinelli).

There is never one type of decoration for one type of building or object; on the contrary, there are decorative principles which are pan-Islamic and applicable to all types of buildings and objects at all times (whence comes the intimate relationship in Islam between all the applied arts and architecture). Islamic art must therefore be considered in its entirety because each building and each object embodies to some extent identical principles (Jones 1978:161).

Islamic art, constrained, or maybe underpinned by the aniconic approach, concentrates on geometric pattern and draws attention away from the representational world to one of pure form and meaning. To trace the origin in creation the direction is not backwards but inwards (Critchlow 1976:8). The seemingly abstract forms enhance the quality of contemplation with its unbroken rhythm and endless interweaving,

The poetic imagery of interlacement cannot only be observed; it must be read, like Arabic script, by letting the eye follow the flow of intertwining.

The filled space and the empty area, the design and its ground are both of equivalent value and balance each other, in the same way that the lines always flow back on themselves. Unity is beyond all representation and can only be reflected - by harmony, by the unity in the multiplicity.

Notes

1. Nasr here surely means "creations" rather than "revelations"; the first revelation is generally accepted as that of Surah 96 [Iqra] - *Read in the name of...* For the creation of order, see Surah 2 [Baqara]:117 & Surah 7 (A'rāt)::54.
2. This explanation adapted from Critchlow, 1976:9-19.

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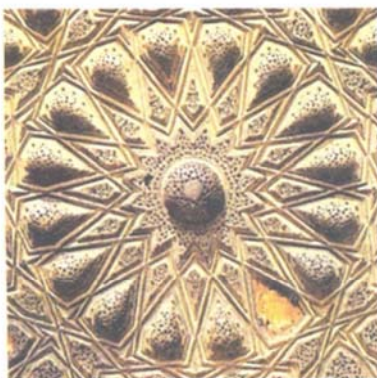
FIGURE 17: Details of a pattern in marble inside the Great Mosque, Damascus, Syria (706-15) based on the hexagon (Burckhardt 1976:63). FIGURE 18: Rattan shield, Landesmuseum, Karlsruhe. Shoots of the rattan palm in 45 concentric spirals around a wooden core clad in iron boss. Apart from the appeals to Allah woven into the border in silver thread, there are also cypress trees, flowering trees and decorative triangles made of silk in various colours (Hattstein & Delius 2000:573). FIGURE 19: The star with six, eight, sixteen or more points is one of the fundamental shapes in geometric design. It is applied equally easily in two and three dimensions - to transform a dome in a complex web of interwoven planes or to decorate bronze or wooden finishes. Details of a door in the Madrasa of Sultan Hasan (1356-9), Cairo (Michell 1978:148). FIGURE 20: Pilgrim's flask, Syria, mid C13, bronze with silver inlay, detail, Smithsonian Institution, Freer Gallery of Art, Washington (Hattstein & Delius 2000:205).

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FIGURE 21: There was no religious, or for that matter, public painting in the world of Islam, for painting was a private art both in execution and appreciation. It often received royal patronage, but was not open for the public (Bamborough 1977:42). The ceramic bowl (Syria, circa 1200, David Collection, Copenhagen) is one of the few extant examples in which a human being is depicted – a prince on his throne, surrounded by elegant arabesque, neatly contained in the circle and underlying square (Hattstein & Delius 2000:197, detail of photo: Ole Woldbye). **FIGURE 22:** Sūfī mysticism existed side by side with orthodox Islam and offered a direct means of contact with God through prayer, isolation and other techniques. Dance was normally an expression of emotion and ecstasy brought about by music or verse. Physical motion served as aid towards psychic enlightenment. While the environment is depicted as pastoral, the dance would take place in a building, dedicated to dervish ritual (tekke). Here four men dance in a circle of musicians. The circular composition and waving horizon convey the ecstatic dance aimed at drawing the dancers out (Lewis 1976:129). Manuscripts of the Divan of Hafiz, Heart School, 1490, Metropolitan Museum of Art, New York (Lewis 1976:128–129).